

We claim:

1. An aqueous-based cross-linkable binder composition comprising
  - (A) an aqueous dispersion of an aldehyde-functional polyurethane having  
5 a number average molecular weight of more than 1,000 and an average aldehyde functionality of  $\geq 2$ , which polyurethane comprises ionic and/or non-ionic dispersing groups, and
  - (B) a low-molecular weight aldehyde-reactive cross-linker selected from  
10 the group of low-molecular weight polyamines, and low-molecular weight compounds comprising at least one group of one of the formulae  $E^1\text{-CHR}^1\text{-E}^2$  and  $\text{H-C-(E}^1\text{E}^2\text{E}^3)$ , wherein  $\text{-E}^1$ ,  $\text{-E}^2$  and  $\text{-E}^3$  are independently chosen from electron-withdrawing groups such as  $\text{-P(=O)-O-}$ ,  $\text{-CO-}$ ,  $\text{-CN}$ ,  $\text{-SO}_2\text{-}$ ,  $\text{-NO}_2$  and wherein  $\text{R}^1$  has the  
15 meaning of hydrogen or a hydrocarbon radical having 1 to 10 carbon atoms.
2. The aqueous-based cross-linkable binder composition according to claim 1, wherein the cross-linker comprises acetoacetate groups.
- 20 3. The aqueous-based cross-linkable binder composition according to claim 1, wherein the number average molecular weight of the aldehyde-functional polyurethane is within the range of from 1,000 to 100,000.
4. The aqueous-based cross-linkable binder composition according to claim 1,  
25 wherein the polyurethane is obtainable by reaction of:
  - a) an organic polyisocyanate,
  - b) an organic compound containing at least two isocyanate-reactive groups and having a number average molecular weight in the range of 400 to 6,000,
  - c) (a) mono-functional and/or poly-functional isocyanate-reactive  
30 compound(s) bearing nonionic and/or ionic dispersing groups (or groups which may subsequently be converted into such dispersing groups),
  - d) an isocyanate-reactive aldehyde-functional compound,

e) optionally, an organic polyol having a weight average molecular weight of less than 400, and

f) optionally, active hydrogen-containing chain extending material.

- 5 5. The aqueous-based cross-linkable binder composition according to claim 4, wherein the ionic dispersing group is an anionic dispersing group selected from the group of carboxylate, sulphonate and/or phosph(on)ate salt groups.
- 10 6. The aqueous-based cross-linkable binder composition according to claim 4, wherein the for the nonionic dispersing group use is made of a C<sub>1</sub>-C<sub>4</sub> alkoxy poly C<sub>2</sub>-C<sub>3</sub> alkylene-oxide group in an amount between 2.5 and 20 wt.%, based on the polyurethane.
- 15 7. The aqueous-based cross-linkable binder composition according to claim 6, wherein the C<sub>1</sub>-C<sub>4</sub> alkoxy poly C<sub>2</sub>-C<sub>3</sub> alkylene-oxide group is used in an amount between 5 and 15 wt.%.
- 20 8. The aqueous-based cross-linkable binder composition according to claim 1, wherein the aldehyde-functional polyurethane to low-molecular weight aldehyde-reactive cross-linker equivalence ratio, based on the aldehyde-reactive groups of the low-molecular weight cross-linker and the aldehyde groups of the polyurethane, is in the range of from 0.5:1 to 5:1.
- 25 9. The aqueous-based cross-linkable binder composition according to claim 2, wherein the acetoacetate cross-linker is selected from the group of trimethylol propane triacetoacetate and trimethylol ethane triacetoacetate.
- 30 10. The aqueous-based cross-linkable binder composition according to claim 1, wherein the polyamine cross-linker is selected from the group of  $\alpha,\omega$ -alkylene diamines having from 2 up to 20 carbon atoms in the alkylene group, cyclohexylene diamines, 2-methyl piperazine, isophorone diamine,

adducts of a (poly)amino compound to a polyfunctional epoxy, isocyanate, maleinate, fumarate or (meth)acryloyl compound, and hydrogenated polynitro or polynitrile compounds.

- 5    11.    The aqueous-based cross-linkable binder composition according to claim 10, wherein the polyamine cross-linker is 3-[2,2-bis-(3-amino-propoxymethyl)-butoxy]-propylamine.
12.    A method of using the binder composition according to claim 1 in the  
10    production of primer compositions or clear coat compositions.
13.    A method of using the binder composition according to claim 1 in the refinishing of cars.

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